

Closure Plan Administrative Order on Consent Activities

Nevada Power Company
Reid Gardner Station

Final
January 2008
20618.01



Certifications

NPC Certification

I certify that this document and all attachments submitted to the Division were prepared under the direction or supervision of NPC in accordance with a system designed to gather and evaluate the information by appropriately qualified personnel. Based on my inquiry of the person or persons who manage the system(s) or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted and provided by NPC is, to the best of my knowledge and belief, true, accurate, and complete in all material respects. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____
Name: _____
Title: _____
Company: _____
Date: _____

Certified Environmental Manager Certification

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

Signature: _____

Name: _____

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Introduction and Background

This Closure Plan (Plan) has been prepared for Nevada Power Company (NPC), Reid Gardner Generating Station (Station), located in Moapa, Nevada. NPC and the Nevada Division of Environmental Protection, Bureau of Corrective Actions (“NDEP-BCA” or “NDEP” or “the Division”) have negotiated an Administrative Order on Consent (AOC) for the Station. The AOC provides for the continuation of environmental contaminant characterization activities in soil and groundwater at the site. Additionally, the AOC will allow for the identification and/or screening of corrective actions, and allows for the implementation and long-term operation and maintenance of the NDEP-BCA approved corrective actions at, or associated with, the Station. The NDEP has primary authority and responsibility for regulatory oversight at the Station. This Closure Plan is being prepared in accordance with Section 3.1.3 of the Scope of Work that is a part of the AOC.

The Station is a coal-fired electric power generation facility that produces approximately 600 MW of power from four generating units (Units 1,2,3 and 4). The Station is located within the Moapa Valley, a large, relatively flat-bottomed valley occupied by the Muddy River, a spring-fed perennial stream that bisects the Station property. Prior to 1964, the site was native desert or irrigated pasturelands. The Station became commercially operational in 1965 and evaporation ponds were constructed for treatment of scrubber blow down waste water with the addition of SO₂ scrubbers on Units 1, 2, and 3 in 1976. A dairy was previously operated on the land east of the Station along both sides of the Muddy River. This property was recently sold to a private developer and currently is largely vacant. The Bureau of Land Management (BLM) owns the surrounding land to the north and south of the Station which is also largely vacant. An additional parcel of land located north of the C ponds is currently owned by a private developer. Unit 4 is a joint ownership facility with the California Department of Water Resources (CDWR) as the majority owner (67.8%) that went into service in 1983.

The Station obtains its water supply from a combination of offsite groundwater wells and offsite surface water withdrawals from the Muddy River. The water is combined and stored in raw water storage ponds for use throughout the Station. Water is used onsite for cooling, flue gas desulfurization, and other uses. In order to reduce water usage, the Station recycles its water as much as possible. The flue gas desulfurization wastewater is discharged first to one of three ash water settling ponds to allow suspended solids (fly ash) to settle out. The Station operates an onsite permitted solid waste disposal facility for ash, solids cleaned from the ash water settling and evaporation ponds, and various other facility wastes. The decanted wastewater is then discharged directly to one of five active evaporation ponds (Ponds B-1 and B-2 are currently out of service for relining) for final wastewater disposal; there are no surface water discharges from the Station. Cooling water blowdown is treated and reused as scrubber water makeup.

Because the Station wastewater contains dissolved solids and because these dissolved solids are concentrated by process water recycling, the wastewater discharged to the evaporation ponds is high in total dissolved solids (TDS). The evaporation ponds were originally designed and constructed, according to regulations in effect at the time, utilizing clay material with clay berms. Although the ponds did not have engineered clay liners, Ponds F and G were designed and constructed with clay cores in the berms. This design resulted in release of elevated TDS water into the site groundwater. Since October 19, 2005, no further release was authorized by the NDEP Discharge Permit.

In May 1997 the NDEP issued Administrative Order No. NV052797W1 requiring NPC to submit a site wide plan and schedule to eliminate the migration of contaminants into the groundwater. In compliance with the order, NPC submitted a plan and a progressive schedule committing to either line all ash water settling ponds and evaporation ponds with double synthetic liner systems or remove them from service by April 2010. To date, NPC has removed two evaporation ponds from service (Ponds 4A and D), installed liner systems in five evaporation ponds (Ponds 4C1, 4C2, 4B3, E1 and E2) and one ash water settling pond (Pond F), constructed one new ash water settling pond with a single liner system (Mesa Pond), is currently constructing liner systems in two evaporation ponds (Ponds 4B2 and 4B1), and plans to construct the final liner system in one ash water settling pond (Pond G) in 2008.

In addition to the groundwater contamination associated with the onsite ponds, a variety of past practices have caused onsite soil and/or groundwater contamination. Various areas of past solid waste disposal onsite, an area of diesel fuel leakage, and other isolated areas of soil and/or groundwater contamination have been identified. All areas of soil and groundwater contamination caused by the Station operations will be addressed through implementation of the AOC, specifically as identified by site characterization during development of the scope of work, and remediated where appropriate.

Analytical data collected as part of the implementation of this AOC will comply with Data Quality Objectives (DOs) established by the United States Environmental Protection Agency, as indicated in the Quality Assurance Plan (QAP) that was generated under separate cover. Additionally, all analytical data will be validated by a third party.

The purpose of this Plan is not to discuss remediation methods, as final site characterization including the identification of chemicals of potential concern and preparation of a Site-Wide Conceptual Model, have not been completed. Rather, this Plan will act as a “road map” that describes the process by which remedial activities at the site and/or specific sub-areas of the site will be completed. This Plan discusses how soil and groundwater action levels may be established and which regulations and regulatory guidelines can be followed to demonstrate that corrective action activities have been completed.

Closure Alternatives

This section outlines different pathways towards site-wide closure or closure of specific sub-areas of the site with soil and/or groundwater contamination. Procedures for establishing action levels and conditions for terminating remediation are outlined in Nevada Administrative Code (NAC) Chapter 445A and are discussed in this section. Although the primary focus of site investigation and remediation is on soil and groundwater contamination, procedures for addressing surface water and sediment are also included for reference. A copy of NAC 445A.226 and 445A.227 “Action Levels for Contaminated Sites” is included in Appendix A along with sections of the regulations that apply to surface waters at the Station (NAC 445A.120, NAC 445A.121, NAC 445A.144, and NAC 445A.210).

2.1 Groundwater Closure Alternatives

Once NPC has defined the extent of groundwater contamination at the Station, or a specific area of the Station, the groundwater data will be compared with the appropriate groundwater action levels. If one or more parameters exceed the appropriate action levels, a remedial approach will be developed to return groundwater to the appropriate action levels. Section 2.1.1 describes the four different groundwater action levels allowed by Nevada regulations and Section 2.1.2 describes the circumstances when Nevada regulations allow an exemption from these action levels. Section 2.1.3 describes the regulatory requirements for determining that groundwater remediation is complete. Groundwater action levels may vary for different parameters and different areas of the site; however, these action levels must be set in accordance with the applicable Nevada regulations, as described below.

2.1.1 Groundwater Action Levels

Groundwater action levels are established as the level of contamination above which remediation is required. These same action levels are used as the goal for remediation; once it has been demonstrated that a site has been cleaned up to the appropriate action levels, the remediation is complete. Groundwater action levels are defined in NAC 445A.22735 as follows:

- The presence of a hazardous substance, hazardous waste or a regulated substance in groundwater at a level of concentration equal to the maximum contaminant level (MCL) for that substance or waste established pursuant to the Safe Drinking Water Act, 42 U.S.C. §§ 300f et seq., and 40 C.F.R. Part 141, as those sections existed on October 3, 1996.
- A level of concentration equal to the background concentration of a hazardous substance, hazardous waste or a regulated substance, if that level of concentration is greater than the MCL established pursuant to the bullet above. During the AOC implementation, a study will be conducted to establish background groundwater concentrations that can be used for considering action levels at the Station.
- If an MCL has not been established for a hazardous substance, hazardous waste or a regulated substance, a level of concentration equal to the background concentration of the waste or substance can be used. Alternatively, an appropriate level concentration that is based on the protection of public health and safety and the environment can be determined using the Integrated Risk Information System, adopted by reference in NAC 445A.2272, or an equivalent method approved by the Division.
- For petroleum contamination, the presence of 1/2 inch or more of a petroleum substance that is free-floating on the surface of the water of an aquifer, using a measurement accuracy of .01 feet.

In establishing an action level, NDEP may consider:

- The presence of more than one parameter in the groundwater;
- Any potential threat the contamination may pose to sensitive areas of the environment; and
- Any other threat or potential threat to groundwater that is specifically related to the site.

If more than one action level for groundwater may be established, the most restrictive action level must be used.

2.1.2 Request for Exemption

NAC 445A.22725 states that the NDEP may require corrective action if a release contaminates groundwater and the level of contamination exceeds the action level established for the groundwater. However, the Station could submit a written request to the NDEP for an exemption. The NDEP may grant the exemption if the groundwater contaminated by the release is not a source of drinking water and is not likely to be a source of drinking water because it is economically or technologically impractical to:

- Recover the water for drinking because of the depth or location of the water, or
- Render the water fit for human consumption.

The NDEP may also grant the exemption if the total dissolved solids (TDS) concentration in the unaffected groundwater is more than 10,000 milligrams per liter (mg/L) and the groundwater is not reasonably expected to be a source of drinking water. However, NPC would not be eligible for this exemption, because unaffected groundwater in the area has a TDS concentration less than 10,000 mg/L.

In addition, the NDEP may not require the Station to take corrective action if they submit a study which demonstrates that, based on a review of available technology and the prohibitive cost of the corrective action; it is not feasible to achieve the remediation standard.

2.1.3 Conditions for Terminating Groundwater Remediation

Conditions for terminating groundwater remediation are established in NAC 445A.22745. After any groundwater corrective action is begun, NPC will monitor the contaminated groundwater for at least one year. The NDEP will determine the frequency of the monitoring, but it will not be more frequent than monthly. After any corrective action is completed, NPC may terminate remediation if one of the following is true:

- An assessment of the contaminated groundwater indicates that the level of contamination is consistently below the groundwater action level.
- After the groundwater is treated for at least one year, the concentration of dissolved constituents in the water, measured monthly, fits an asymptotic curve.

2.2 Soil Closure Alternatives

Once NPC has defined the extent of soil contamination at the Station, or a specific area of the Station, the soil data will be compared with the appropriate soil action levels. If one or more parameters exceed the appropriate action levels, a remedial approach will be developed and proposed to return soil to the appropriate action levels or remove soil above specified action levels. Section 2.2.1 describes the four different soil action levels allowed by Nevada regulations and Section 2.2.2 describes the considerations that can be used to determine that remediation is not required for soil exceeding an action level. Soil action levels may vary for

different parameters and different areas of the Station; however, these action levels must be set in accordance with the following Nevada regulations.

2.2.1 Soil Action Levels

Soil action levels are established as the level of contamination above which remediation is required. These same action levels are used as the goal for remediation; once it has been demonstrated that a site has been cleaned up to the appropriate action levels, the remediation is complete. Soil action levels are defined in NAC 445A.2272 as:

- The background concentration or volume of a hazardous substance, hazardous waste or a regulated substance set forth in the permit issued to the owner or operator by the Division.
- If the potential for human exposure or damage to the environment from contaminated surface water or groundwater is the primary pathway of concern, the presence of a hazardous substance, hazardous waste or regulated substance in soil at the level of concentration of that substance or waste listed in the Toxics Characteristics Leaching Rule, 40 CFR Part 261.24, as it existed on October 3, 1996. The level of concentration must be measured using Analytical Method 1311, adopted by the Environmental Protection Agency, as it existed on October 3, 1996, or an equivalent method approved by the Division.
- If inhalation, ingestion or dermal exposure is the primary pathway of concern or an applicable level of concentration is not listed in the Toxicity Characteristics Leaching Rule, the presence of a hazardous substance, hazardous waste or regulated substance in the soil at an appropriate level of concentration that is based on the protection of public health and safety and the environment. The appropriate level of concentration must be determined by the Division using the Integrated Risk Information System, adopted by the Environmental Protection Agency, as it existed on October 3, 1996, or an equivalent method chosen by the Division.
- The presence of petroleum substance in soil in excess of 100 milligrams per kilogram. The level of concentration must be measured using Analytical Method 8015, adopted by the Environmental Protection Agency and modified for petroleum hydrocarbons, as is exists on October 3, 1996, or an equivalent method approved by the Division.

If more than one action level for soil may be established, the most restrictive action level must be used. In no case may the action level be more restrictive than the background concentration.

2.2.2 Considerations for Soil Remediation

NAC 445A.227 states that the NDEP may require corrective action if a release contaminates soil and the level of contamination exceeds the action level established for the soil. However, in determining whether corrective action is required, the NDEP will consider:

- The depth of any groundwater;
- The distance to irrigation wells or drinking water wells;
- The type of soil that is contaminated;
- The annual precipitation;
- The type of waste or substance that was released;
- The extent of the contamination;
- The present and potential use for the land;
- The preferred routes of migration;
- The location of structures or impediments;
- The potential for a hazard related to fire, vapor or an explosion; and
- Any other appropriate information.

NAC 445A.22705 states that if an owner or operator is required to take corrective action pursuant to NAC 445A.227, the owner or operator may conduct an evaluation of the site, based on the risk it poses to public health and the environment, to determine the necessary remediation standards or to show that corrective action is not necessary. For the Station, areas where soil concentrations exceed an action level will be evaluated using the above considerations to determine whether remediation is required. The above considerations can also be used to determine that soil remediation is complete even though soil action levels have not been attained.

2.3 Surface Water Quality

Pursuant to 445A.2275, the Director may require an owner or operator to take corrective action if the release of a hazardous substance, hazardous waste or a regulated substance contaminates surface water and the level of contamination exceeds the action levels described below. Because the AOC implementation activities are focused on soil and groundwater investigation and remediation, these standards are provided for reference only in this Closure Plan.

2.3.1 General Surface Water Quality Standards.

Water quality standards applicable to all surface waters in the state, including the Muddy River, are described in 445A.121 and summarized below:

- Waters must be free from substances that will settle to form sludge in amounts sufficient to be unsightly, putrescent or odorous.
- Waters must be free from floating debris, oil, grease, scum and other floating materials.

- Waters must be free from materials sufficient to produce taste or odor in the water or detectable off-flavor in the flesh of fish; or in amounts sufficient to change the existing color, turbidity or other conditions in the receiving stream.
- Waters must be free from high temperature, biocides, organisms pathogenic to human beings, toxic, corrosive or other deleterious substances at levels that would be toxic to human, animal, plant or aquatic life.
- Radioactive materials must be the minimum concentrations that are physically and economically feasible to achieve. The concentrations in water must not result in accumulation of radioactivity in plants or animals that result in a hazard to humans or harm to aquatic life.
- Wastes containing arsenic, barium, boron, cadmium, chromium, cyanide, fluoride, lead, selenium, silver, copper and zinc must not be discharged untreated or uncontrolled into the waters of Nevada.

The standards summarized above are not considered violated when the natural conditions of the receiving water are outside the established limits, including periods of extreme high or low flow. If effluents are discharged to such waters, the discharges are not considered to contribute to substandard conditions provided maximum treatment in compliance with permit requirements is provided.

Standards applicable to specific beneficial surface water uses are established in NAC 445A.122 and summarized below:

- Livestock watering - The water must be suitable for watering livestock without treatment.
- Irrigation - The water must be suitable for irrigation without treatment.
- Aquatic Life - The water must be suitable as habitat for fish and other aquatic life present in a body of water.
- Contact Recreation - There must be no evidence of man-made pollution, floating debris, sludge accumulation or similar pollutants.
- Non-Contact Recreation - The water must be free from visible floating, suspended or settled solids; sludge; slime infestation; heavy growth of plants or plankton; discoloration or excessive acidity or; surfactants that foam when the water is agitated or aerated; and excessive water temperatures.
- Municipal or Domestic Supply - The water must be capable of being treated by conventional water treatment methods to comply with Nevada's drinking water standards.
- Industrial Supply - The water must be treatable to be suitable for the intended use.

- Propagation of Wildlife - The water must be suitable for propagation of wildlife and waterfowl without treatment.
- Waters of Extraordinary Ecological or Aesthetic Value - The unique ecological or aesthetic value of the water must be maintained.
- Enhancement of Water Quality - The water must support natural enhancement or improvement of water quality in any downstream water.

As stated in NAC 445A.209, the following beneficial uses apply to the Muddy River at the Station:

- Livestock Watering
- Irrigation
- Aquatic Life
- Non-Contact Recreation
- Municipal or Domestic Supply
- Industrial Supply
- Propagation of Wildlife

2.3.2 Surface Water Quality Standards for Toxic Materials.

NAC 445A.144 includes numeric water quality standards for inorganic and organic chemicals that apply to surface water, including the Muddy River. These standards vary depending on the designated use of the water body.

2.3.3 Surface Water Quality Standards Specific to the Muddy River.

Based on the location of the Station along the Muddy River at a point between the river's source and the Glendale Bridge, water quality standards specific to the Muddy River presented in NAC 445A.210 apply to the section of the Muddy River that travels through the Station. These numeric water quality standards include temperature, nutrients, dissolved oxygen, bacteriological parameters, and general water quality parameters.

Section 3

Closure Process

Section XV (Determination of Completion) of the AOC negotiated between NPC and NDEP describes the procedure for determining that no further site remediation is necessary. This procedure can be followed for the entire Station or for smaller sub-areas of the Station. As stated in the AOC, if NPC believes that no further remediation is necessary in an area to protect human health and the environment, NPC may propose that the NDEP issue a written notice to that effect. The NDEP may consider the following factors when evaluating the proposal:

- Existing and potential or planned land uses for the site and the environmental and human health threats associated with those land uses;
- Whether the issuance of a written notice would preclude or significantly and adversely affect the investigation or corrective action activities at the site or associated with the site;
- The sampling data and other information provided by NPC; and
- Applicable or relevant and appropriate environmental cleanup standards.

Within 90 days after NPC concludes that the corrective actions for the area or a sub-area of the Station have been completed and the appropriate action levels have been attained (not withstanding exemptions), NPC will schedule and conduct a pre-determination inspection with the NDEP.

Within 30 days after the pre-determination inspection, if NPC still believes that the corrective actions have been completed, the appropriate action levels have been attained, and no further remediation is necessary to protect human health and the environment, NPC may propose that the NDEP acknowledge this status in writing. NPC will submit a written proposal (Statement of Completion) to the NDEP along with a report including data and analysis to support its opinion. In the report, a Nevada Certified Environmental Manager (CEM) and NPC's authorized

representative will state that the corrective actions have been completed in full satisfaction of the requirements of the AOC. The written report will include as-built drawings signed and sealed by a Nevada licensed professional engineer. The written report will be signed in accordance with the certification requirements in Section XII (Reporting Requirements) of the AOC.

The NDEP will review the report and take appropriate action to confirm that the remediation is complete. If the NDEP agrees that the remediation is complete, they will provide NPC with a “No Further Action” letter.

If the NDEP determines that the corrective actions have not been completed or that the appropriate action levels have not been achieved, the NDEP will notify NPC in writing of the activities that must be undertaken to complete the corrective actions and achieve the appropriate action levels. The NDEP will provide a schedule for completing the remediation or require NPC to submit a schedule for approval. NPC will perform all the activities required by the NDEP in accordance with the specifications and schedules agreed to with the NDEP.

If, after completing the additional required corrective actions, NPC once again believes they have completed remediation, they will begin the process again by scheduling a pre-determination inspection with the NDEP.

When NPC has fulfilled all obligations under the AOC, including the payment of any costs and stipulated penalties to the NDEP, they will submit a Statement of Completion to the NDEP as referenced above. Within a reasonable period of time after receiving the Statement of Completion, not to exceed 180 days, the NDEP will send NPC a written notice that either states that all AOC obligations have been fulfilled or that lists additional activities that are required. Once the NDEP issues a notice that NPC has satisfied all of their obligations under the AOC, the AOC will be terminated.

Appendix A

APPLICABLE PORTIONS OF NEVADA ADMINISTRATIVE CODE

7.4	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89	4.59	4.30
7.5	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51	4.23	3.97
7.6	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11	3.85	3.61
7.7	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70	3.47	3.25
7.8	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89
7.9	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89	2.71	2.54
8.0	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52	2.36	2.21
8.1	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17	2.03	1.91
8.2	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85	1.74	1.63
8.3	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48	1.39
8.4	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17
8.5	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.06	0.990
8.6	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951	0.892	0.836
8.7	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805	0.754	0.707
8.8	1.07	1.01	0.944	0.885	0.829	0.778	0.729	0.684	0.641	0.601
8.9	0.917	0.860	0.806	0.756	0.709	0.664	0.623	0.584	0.548	0.513
9.0	0.790	0.740	0.694	0.651	0.610	0.572	0.536	0.503	0.471	0.442

¹ The chronic water quality criteria for total ammonia for waters where freshwater fish in early life stages are absent were calculated using the following equation, which may also be used to calculate unlisted values:
Chronic water quality criteria for ammonia (fish in early life stages absent) =

$$\left[\frac{0.0577}{(1 + 10^{7.688 - pH})} + \frac{2.487}{(1 + 10^{pH - 7.688})} \right] \times 1.45 \times \left[10^{0.028 \times (25 - \text{MAX}(T, 7))} \right] \quad \text{where:}$$

T=°C

x means multiplication

MAX means the greater of the two values separated by the comma

² At 15°C and above, the criteria for waters where freshwater fish in early life stages are absent is the same as the criteria for waters where freshwater fish in early life stages may be present

NOTES FOR TABLES 1, 2 AND 3:

- pH and temperature are field measurements that must be taken at the same time and location as the water sample destined for the laboratory analysis of ammonia.

- If the field-measured pH or the temperature values, or both, fall between the tabular values set forth in this section, the field-measured values or temperature values, as appropriate, must be rounded according to standard rounding procedures to the nearest tabular value to determine the applicable ammonia standard, or the equations provided in this section may be used to calculate unlisted values

(Added to NAC by Environmental Comm'n by R099-02, eff. 12-17-2002)

NAC 445A.120 Applicability. (NRS 445A.425, 445A.520)

1. NAC 445A.120 to 445A.225, inclusive, apply to all natural streams and lakes, reservoirs or impoundments on natural streams and other specified waterways, unless excepted on the basis of existing irreparable conditions which preclude such use. Man-made waterways, unless otherwise specified, must be protected for public health and the use for which the waterways were developed.

2. The quality of any waters receiving waste discharges must be such that no impairment of the beneficial usage of water occurs as the result of the discharge. Natural water conditions may, on occasion, be outside the limits established by standards. The standards adopted in NAC 445A.120 to 445A.225, inclusive, relate to the condition of waters as affected by discharges relating to the activities of man.

[Environmental Comm'n, Water Pollution Control Reg. § 4.1, eff. 5-2-78]—(NAC A 12-3-84; R017-99, 9-27-99)

NAC 445A.121 Standards applicable to all surface waters. (NRS 445A.425, 445A.520) The following standards are applicable to all surface waters of the State:

1. Waters must be free from substances attributable to domestic or industrial waste or other controllable sources that will settle to form sludge or bottom deposits in amounts sufficient to be unsightly, putrescent or odorous or in amounts sufficient to interfere with any beneficial use of the water.

2. Waters must be free from floating debris, oil, grease, scum and other floating materials attributable to domestic or industrial waste or other controllable sources in amounts sufficient to be unsightly or in amounts sufficient to interfere with any beneficial use of the water.

3. Waters must be free from materials attributable to domestic or industrial waste or other controllable sources in amounts sufficient to produce taste or odor in the water or detectable off-flavor in the flesh of fish or in amounts sufficient to change the existing color, turbidity or other conditions in the receiving stream to such a degree as to create a public nuisance or in amounts sufficient to interfere with any beneficial use of the water.

4. Waters must be free from high temperature, biocides, organisms pathogenic to human beings, toxic, corrosive or other deleterious substances attributable to domestic or industrial waste or other controllable sources at levels or combinations sufficient to be toxic to human, animal, plant or aquatic life or in amounts sufficient to interfere with any beneficial use of the water. Compliance with the provisions of this subsection may be determined in accordance with methods of testing prescribed by the Department. If used as an indicator, survival of test organisms must not be significantly less in test water than in control water.

5. If toxic materials are known or suspected by the Department to be present in a water, testing for toxicity may be required to determine compliance with the provisions of this section and effluent limitations. The Department may specify the method of testing to be used. The failure to determine the presence of toxic materials by testing does not preclude a determination by the Department, on the basis of other criteria or methods, that excessive levels of toxic materials are present.

6. Radioactive materials attributable to municipal, industrial or other controllable sources must be the minimum concentrations that are physically and economically feasible to achieve. In no case must materials exceed the limits established in the 1962 Public Health Service Drinking Water Standards (or later amendments) or 1/30th of the MPC values given for continuous occupational exposure in the "National Bureau of Standards Handbook No. 69." The concentrations in water must not result in accumulation of radioactivity in plants or animals that result in a hazard to humans or harm to aquatic life.

7. Wastes from municipal, industrial or other controllable sources containing arsenic, barium, boron, cadmium, chromium, cyanide, fluoride, lead, selenium, silver, copper and zinc that are reasonably amenable to treatment or control must not be discharged untreated or uncontrolled into the waters of Nevada. In addition, the limits for concentrations of the chemical constituents must provide water quality consistent with the mandatory requirements of the 1962 Public Health Service Drinking Water Standards.

8. The specified standards are not considered violated when the natural conditions of the receiving water are outside the established limits, including periods of extreme high or low flow. Where effluents are discharged to such waters, the discharges are not considered a contributor to substandard conditions provided maximum treatment in compliance with permit requirements is maintained.

[Environmental Comm'n, Water Pollution Control Reg. § 4.1.2 subsecs a-g, eff. 5-2-78]—(NAC A 9-26-90; R017-99, 9-27-99)

NAC 445A.122 Standards applicable to beneficial uses. (NRS 445A.425, 445A.520)

1. The following standards are intended to protect both existing and designated beneficial uses and must not be used to prohibit the use of the water as authorized under title 48 of NRS:

(a) Watering of livestock. The water must be suitable for the watering of livestock without treatment.

(b) Irrigation. The water must be suitable for irrigation without treatment.

(c) Aquatic life. The water must be suitable as a habitat for fish and other aquatic life existing in a body of water. This does not preclude the reestablishment of other fish or aquatic life.

(d) Recreation involving contact with the water. There must be no evidence of man-made pollution, floating debris, sludge accumulation or similar pollutants.

(e) Recreation not involving contact with the water. The water must be free from:

(1) Visible floating, suspended or settled solids arising from man's activities;

(2) Sludge banks;

Water	HR	HA	Description of Area Classified
Lagomarsino Creek, also known as Long Valley Creek	6	83	The entire length

WASHOE COUNTY			
Water	HR	HA	Description of Area Classified
Steamboat Creek	6	87	From gaging station number 10-349300, located in the S 1/2 of section 33, T. 18 N., R. 20 E., M D B & M, to its confluence with the Truckee River.

WHITE PINE COUNTY			
Water	HR	HA	Description of Area Classified
Gleason Creek	10	179	From State Highway 485 (old State Highway 44) to its confluence with Murray Creek.
Murray Creek	10	179	From its confluence with Gleason Creek to the south line of section 35, T. 17 N., R. 63 E., M.D.B. & M.

[Environmental Comm'n, Water Pollution Control Reg. §§ 4.2.4, 4.2.4.2 & 4.2.4.3, eff. 5-2-78; § 4.2.4.1, eff. 5-2-78; A 11-21-79]—(NAC A 12-3-84; R226-03, 4-23-2004)

NAC 445A.143 Cooperation regarding Colorado River; salinity standards. (NRS 445A.425, 445A.520)

1. The State of Nevada will cooperate with the other Colorado River Basin states and the Federal Government to support and carry out the conclusions and recommendations adopted April 27, 1972, by the Reconvened 7th Session of the Conference in the Matter of Pollution of the Interstate Waters of the Colorado River and its Tributaries.

2. Pursuant to the "2005 Review - Water Quality Standards for Salinity, Colorado River System," as presented by the Colorado River Basin Salinity Control Forum, the flow weighted annual average concentrations for the calendar year for total dissolved solids in mg/l at the three lower main stem stations of the Colorado River are as follows:

Below Hoover Dam.....	723
Below Parker Dam.....	747
Imperial Dam.....	879

[Environmental Comm'n, Water Pollution Control Reg. Appendix B, eff. 5-2-78]—(NAC A 12-3-84; R017-99, 9-27-99; R159-06, 9-18-2006)

NAC 445A.144 Standards for toxic materials applicable to designated waters. (NRS 445A.425, 445A.520)

1. Except as otherwise provided in this section, the standards for toxic materials prescribed in subsection 2 are applicable to the waters specified in NAC 445A.123 to 445A.127, inclusive, and 445A.145 to 445A.225, inclusive. The following criteria apply to this section:

(a) If the standards are exceeded at a site and are not economically controllable, the Commission will review and may adjust the standards for the site.

(b) If a standard does not exist for each designated beneficial use, a person who plans to discharge waste must demonstrate that no adverse effect will occur to a designated beneficial use. If the discharge of a substance will lower the quality of the water, a person who plans to discharge waste must meet the requirements of NRS 445A.565.

(c) If a criterion is less than the detection limit of a method that is acceptable to the Division, laboratory results which show that the substance was not detected shall be deemed to show compliance with the standard unless other information indicates that the substance may be present.

2. The standards for toxic materials are:

Chemical	Municipal or Domestic Supply ⁽¹⁾ (µg/l)	Aquatic Life ^(1 2) (µg/l)	Irrigation ⁽¹⁾ (µg/l)	Watering of Livestock ⁽¹⁾ (µg/l)
INORGANIC CHEMICALS⁽³⁾				
Antimony	146 ^a	-	-	-
Arsenic	50 ^b	-	100 ^c	200 ^d
1-hour average	-	340g ^h	-	-
96-hour average	-	150g ^h	-	-
Barium	2,000 ^b	-	-	-
Beryllium	0 ^a	-	100 ^c	-
hardness <75 mg/l	-	-	-	-
hardness ≥ 75 mg/l	-	-	-	-
Boron	-	-	750 ^a	5,000 ^d
Cadmium	5 ^b	-	10 ^d	50 ^d
1-hour average	-	$(1.136672 - \{\ln(\text{hardness})(0.041838)\})$ * $e^{(1.0166\{\ln(\text{hardness})\} - 3.924)} \text{ g h}$	-	-
96-hour average	-	$(1.101672 - \{\ln(\text{hardness})(0.041838)\})$ * $e^{(0.7409\{\ln(\text{hardness})\} - 4.719)} \text{ g h}$	-	-
Chromium (total)	100 ^b	-	100 ^d	1,000 ^d
Chromium (VI)	-	-	-	-
1-hour average	-	16g ^h	-	-
96-hour average	-	11g ^h	-	-
Chromium (III)	-	-	-	-
1-hour average	-	$(0.316) * e^{(0.8190\{\ln(\text{hardness})\} + 3.7256)} \text{ g h}$	-	-
96-hour average	-	$(0.860) * e^{(0.8190\{\ln(\text{hardness})\} + 0.6848)} \text{ g h}$	-	-
Copper	-	-	200 ^d	500 ^d
1-hour average	-	$(0.960) * e^{(0.9422\{\ln(\text{hardness})\} - 1.700)} \text{ g h}$	-	-
96-hour average	-	$(0.960) * e^{(0.8545\{\ln(\text{hardness})\} - 1.702)} \text{ g h}$	-	-
Cyanide	200 ^a	-	-	-
1-hour average	-	22 ^h	-	-
96-hour average	-	5.2 ^h	-	-
Fluoride	-	-	1,000 ^d	2,000 ^d
Iron	-	-	-	-
96-hour average	-	1,000 ^h	5,000 ^d	-
Lead	50 ^{a b}	-	5,000 ^d	100 ^d
1-hour average	-	$(1.46203 - \{\ln(\text{hardness})(0.145712)\}) * e^{(1.273\{\ln(\text{hardness})\} - 1.460)} \text{ g h}$	-	-
96-hour average	-	$(1.46203 - \{\ln(\text{hardness})(0.145712)\}) * e^{(1.273\{\ln(\text{hardness})\} - 4.705)} \text{ g h}$	-	-
Manganese	-	-	200 ^d	-
Mercury	2 ^b	-	-	10 ^d
1-hour average	-	1.4g ^h	-	-
96-hour average	-	0.77g ^h	-	-
Molybdenum	-	19 ^c	-	-
Nickel	13.4 ^a	-	200 ^d	-
1-hour average	-	$(0.998) * e^{(0.8460\{\ln(\text{hardness})\} + 2.255)} \text{ g h}$	-	-
96-hour average	-	$(0.997) * e^{(0.8460\{\ln(\text{hardness})\} + 0.0584)} \text{ g h}$	-	-
Selenium	-	-	-	-

	50 ^b		20 ^d	50 ^d
1-hour average	-	20 ^a	-	-
96-hour average	-	5 0 ^h	-	-
Silver				
1-hour average	-	$(0.85) * e^{(1.72\{\ln(\text{hardness})\} - 6.59)} \text{ g h}$	-	-
Sulfide (undissociated hydrogen sulfide)				
96-hour average	-	2.0 ^h	-	-
Thallium	13 ^a	-	-	-
Zinc	-	-	2,000 ^d	25,000 ^d
1-hour average	-	$(0.978) * e^{(0.8473\{\ln(\text{hardness})\} + 0.884)} \text{ g h}$	-	-
96-hour average	-	$(0.986) * e^{(0.8473\{\ln(\text{hardness})\} + 0.884)} \text{ g h}$	-	-
ORGANIC CHEMICALS				
Acrolein	320 ^a	-	-	-
Aldrin	0 ^a	3 ^a	-	-
Chlordane	0 ^a	2.4 ^a	-	-
24-hour average	-	0.0043 ^a	-	-
2,4-D	100 ^{a b}	-	-	-
DDT & metabolites	0 ^a	1.1 ^a	-	-
24-hour average	-	0.0010 ^a	-	-
Demeton	-	0.1 ^a	-	-
Dieldrin	0 ^a	2.5 ^a	-	-
24-hour average	-	0.0019 ^a	-	-
Endosulfan	75 ^a	0.22 ^a	-	-
24-hour average	-	0.056 ^a	-	-
Endrin	0.2 ^b	0.18 ^a	-	-
24-hour average	-	0.0023 ^a	-	-
Guthion	-	0.01 ^a	-	-
Heptachlor	-	0.52 ^a	-	-
24-hour average	-	0.0038 ^a	-	-
Lindane	4 ^b	2.0 ^a	-	-
24-hour average	-	0.080 ^a	-	-
Malathion	-	0.1 ^a	-	-
Methoxychlor	100 ^{a b}	0.03 ^a	-	-
Mirex	0 ^a	0.001 ^a	-	-
Parathion	-	-	-	-
1-hour average	-	0.065 ^a	-	-
96-hour average	-	0.013 ^a	-	-
Silvex (2,4,5-TP)	10 ^{a,b}	-	-	-
Toxaphene	5 ^b	-	-	-
1-hour average	-	0.73 ^a	-	-
96-hour average	-	0.0002 ^a	-	-
Benzene	5 ^b	-	-	-
Monochlorobenzene	488 ^a	-	-	-
m-dichlorobenzene	400 ^a	-	-	-
o-dichlorobenzene	400 ^a	-	-	-
p-dichlorobenzene	75 ^b	-	-	-
Ethylbenzene	1,400 ^a	-	-	-
Nitrobenzene	19,800 ^a	-	-	-
1,2-dichloroethane	5 ^b	-	-	-
1,1,1-trichloroethane (TCA)	200 ^b	-	-	-
Bis (2-chloroisopropyl) ether	34 7 ^a	-	-	-
Chloroethylene	2 ^b	-	-	-

(vinyl chloride)				
1,1-dichloroethylene	7 ^b	-	-	-
Trichloroethylene (TCE)	5 ^b	-	-	-
Hexachlorocyclopentadiene	206 ^a	-	-	-
Isophorone	5,200 ^a	-	-	-
Trihalomethanes (total) ^f	100 ^b	-	-	-
Tetrachloromethane	5 ^b	-	-	-
(carbon tetrachloride)				
Phenol	3,500 ^a	-	-	-
2,4-dichlorophenol	3,090 ^a	-	-	-
Pentachlorophenol	1,010 ^a	-	-	-
1-hour average	-	exp{1.005 (pH)-4.830} ^a	-	-
96-hour average	-	exp{1.005 (pH)-5.290} ^a	-	-
Dinitrophenols	70 ^a	-	-	-
4,6-dinitro-2-methylphenol	13.4 ^a	-	-	-
Dibutyl phthalate	34,000 ^a	-	-	-
Diethyl phthalate	350,000 ^a	-	-	-
Dimethyl phthalate	313,000 ^a	-	-	-
Di-2-ethylhexyl phthalate	15,000 ^a	-	-	-
Polychlorinated biphenyls (PCBs)	0 ^a	-	-	-
24-hour average	-	0.014 ^a	-	-
Fluoranthene	42 ^a	-	-	-
(polynuclear aromatic hydrocarbon)				
Dichloropropenes	87 ^a	-	-	-
Toluene	14,300 ^a	-	-	-

Footnotes:

- (1) Single concentration limits and 24-hour average concentration limits must not be exceeded. One-hour average and 96-hour average concentration limits may be exceeded only once every 3 years. See reference a.
- (2) Aquatic life standards apply to surface waters only; "hardness" is expressed as mg/L CaCO₃; and "e" refers to the base of the natural logarithm whose value is 2.718.
- (3) The standards for metals are expressed as total recoverable, unless otherwise noted.

References:

- U.S. Environmental Protection Agency, Pub. No. EPA 440/5-86-001, *Quality Criteria for Water* (Gold Book) (1986).
- Federal Maximum Contaminant Level (MCL), 40 C.F.R. §§ 141.11, 141.12, 141.61 and 141.62 (1992).
- U.S. Environmental Protection Agency, Pub. No. EPA 440/9-76-023, *Quality Criteria for Water* (Red Book) (1976).
- National Academy of Sciences, *Water Quality Criteria* (Blue Book) (1972).
- California State Water Resources Control Board, Regulation of Agricultural Drainage to the San Joaquin River: Appendix D, *Water Quality Criteria* (March 1988 revision).
- The criteria for trihalomethanes (total) is the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform). See reference b.
- This standard applies to the dissolved fraction.
- U.S. Environmental Protection Agency, *National Recommended Water Quality Criteria*, May 2005.

(Added to NAC by Environmental Comm'n, eff. 9-13-85; A 9-25-90; 7-5-94; 11-29-95; R158-06, 9-18-2006)

NAC 445A.145 Control points: Prescription and applicability of numerical standards for water quality; designation of beneficial uses. (NRS 445A.425, 445A.520)

1. Control points are locations where water quality criteria are specified. Criteria so specified apply to all surface waters of Nevada in the watershed upstream from the control point or to the next upstream control point or to the next water named in NAC 445A.123.

2. If there are no control points downstream from a particular control point, the criteria for that control point also apply to all surface waters of Nevada in the watershed downstream of the control point or to the next water named in NAC 445A.123.

3. Each standard is set to protect the beneficial use which is most sensitive with respect to that particular standard.

		: ≤10	wildlife, irrigation, watering of livestock and aquatic life (warm-water fishery).
Total Ammonia (as N) - mg/l	---	f	Aquatic life ^b
Total Dissolved Solids - mg/l	A-Avg : ≤600 S V : ≤700	A-Avg : ≤1000	Municipal or domestic supply ^b irrigation and watering of livestock.
Suspended Solids - mg/l	—	Annual Median : ≤80 ^c	Aquatic life (warm-water fishery) ^b
Sulfate - mg/l	—	S.V. : ≤250	Municipal or domestic supply.
Color - PCU	d	No Adverse Effects	Municipal or domestic supply. ^b
Turbidity - NTU	—	S V : ≤50	Aquatic life (warm-water fishery) ^b and municipal or domestic supply.
Fecal Coliform - No /100ml	Annual Geometric Mean: ≤100 S V : ≤200	≤200/400 ^c	Recreation involving contact with the water ^b recreation not involving contact with the water, municipal or domestic supply, irrigation propagation of wildlife and watering of livestock.
E coli - No /100ml	Annual Geometric Mean	≤126	Recreation involving contact with the water ^b and recreation not involving contact with the water
Single Value	—	≤235	
Sodium - SAR	---	A-Avg : ≤8	Irrigation ^b and municipal or domestic supply.

- a. Maximum allowable increase in temperature above water temperature at the boundary of an approved mixing zone.
b. The most restrictive beneficial use.
c. Based on the minimum of not less than 5 samples taken over a 30-day period, the fecal coliform bacterial level may not exceed a geometric mean of 200 per 100ml nor may more than 10 percent of the total samples taken during any 30-day period exceed 400 per 100ml.
d. Increase in color must not be more than 10 PCU above natural conditions.
e. The maximum allowable point source discharge is S.V. ≤80 mg/l of suspended solids
f. The ambient water quality criteria for ammonia are specified in NAC 445A 118.

[Environmental Comm'n, Water Pollution Control Reg. part § 4.2 5, Table 53, eff 5-2-78; A 1-25-79; 8-28-79; 1-25-80; 12-3-80]—(NAC A 6-29-84; 11-29-95; R099-02, 12-17-2002)

NAC 445A.209 Beneficial uses for Muddy River at Glendale Bridge. (NRS 445A.425, 445A.520)

The standards for water quality for the Muddy River at Glendale Bridge are prescribed in NAC 445A.210 The beneficial uses for this area are:

1. Irrigation;
2. Watering of livestock;
3. Recreation not involving contact with the water;
4. Industrial supply;
5. Municipal or domestic supply, or both;
6. Propagation of wildlife; and
7. Propagation of aquatic life.

(Added to NAC by Environmental Comm'n, 7-31-85, eff 8-1-85)—(Substituted in revision for NAC 445.1379)

NAC 445A.210 Muddy River at Glendale Bridge. (NRS 445A.425, 445A.520)

STANDARDS OF WATER QUALITY
Muddy River

Control Point at Glendale Bridge The limits of this table apply from the Glendale Bridge upstream to the river source

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	BENEFICIAL USES
Temperature °C - Maximum		Nov-Jun : ≤21°C Jul-Oct : ≤32°C	Aquatic life ^b
ΔT ^a	ΔT = 0°C	ΔT ≤2°C	

pH Units	—	S.V : 6.5 - 9.0 Δ pH : ± 0.5 Max	Propagation of wildlife, ^b aquatic life, ^b recreation not involving contact with the water, irrigation, watering of livestock, municipal or domestic supply and industrial supply.
Total Phosphates (as P) - mg/l	—	A-Avg : ≤ 0.1	Aquatic life, ^b recreation not involving contact with the water, and municipal or domestic supply.
Nitrogen Species (N) - mg/l	Total Nitrogen A-Avg : ≤ 1.3 S.V : ≤ 1.4	Nitrate S.V : ≤ 10 Nitrite S.V : ≤ 1.0	Municipal or domestic supply, ^b aquatic life recreation involving contact with the water, watering of livestock, propagation of wildlife and recreation not involving contact with the water.
Total Ammonia (as N) - mg/l	—	f	Aquatic life ^b
Dissolved Oxygen - mg/l	—	S.V : ≤ 5.0	Aquatic life, ^b recreation not involving contact with the water, propagation of wildlife, watering of livestock, and municipal or domestic supply.
Turbidity - NTU	—	e	Aquatic life ^b and municipal or domestic supply
Color - PCU	—	d	Aquatic life ^b and municipal or domestic supply.
Total Dissolved Solids - mg/l	—	c	Municipal or domestic supply, ^b irrigation and watering of livestock.
Alkalinity (as CaCO_3) - mg/l	—	less than 25% change from natural conditions	Aquatic life ^b and propagation of wildlife
Fecal Coliform - No./100ml	—	A.G.M. : ≤ 1000 S.V : ≤ 2000	Recreation not involving contact with the water, ^b municipal or domestic supply, ^b irrigation, propagation of wildlife and watering of livestock.
E coli - No./100ml Annual Geometric Mean	—	≤ 630	Recreation not involving contact with the water ^b

- a. Maximum allowable increase in temperature above water temperature at the boundary of an approved mixing zone, but the increase must not cause a violation of the single value standard.
- b. The most restrictive beneficial use.
- c. The salinity standard for the Colorado River System is specified in NAC 445A.143.
- d. Increase in color must not be more than 10 PCU above natural conditions.
- e. Increase in turbidity must not be more than 10 NTU above natural conditions.
- f. The ambient water quality criteria for ammonia are specified in NAC 445A.118.

[Environmental Comm'n, Water Pollution Control Reg. part § 4.2.5, Table 54, eff. 5-2-78; A 1-25-79; 8-28-79; 1-25-80; 12-3-80]—(NAC A 7-31-85, eff. 8-1-85; R099-02, 12-17-2002)

NAC 445A.211 Muddy River at Overton. (NRS 445A.425, 445A.520)

STANDARDS OF WATER QUALITY Muddy River

Control Point at Overton The limits of this table apply from the mouth of the river at Lake Mead to the Glendale Bridge.

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	BENEFICIAL USES
Temperature °C- Maximum ΔT^a	$\Delta T = 0^\circ\text{C}^a$	Nov-Jun : $\leq 21^\circ\text{C}$ Jul-Oct : $\leq 32^\circ\text{C}$ $\Delta T \leq 2^\circ\text{C}$	Aquatic life ^b
pH Units	—	S.V : 6.5 - 9.0 Δ pH : ± 0.5 Max	Propagation of wildlife, ^b aquatic life, ^b recreation not involving contact with the water, irrigation, watering of livestock and industrial supply.
Total Phosphates (as P) - mg/l	—	A-Avg : ≤ 0.3	Aquatic life ^b and recreation not involving contact with the water.
Nitrogen Species (N) - mg/l	Total Nitrogen A-Avg : ≤ 1.3 S.V : —	Nitrate S.V : ≤ 90 Nitrite S.V : ≤ 5.0	Aquatic life ^b watering of livestock, propagation of wildlife and recreation not involving contact with the

Action Levels for Contaminated Sites

NAC 445A.226 Definitions. (NRS 445A 425) As used in NAC 445A 226 to 445A.22755, inclusive, unless the context otherwise requires, the words and terms defined in NAC 445A 22605 to 445A.2268, inclusive, have the meanings ascribed to them in those sections
(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22605 "Action level" defined. (NRS 445A.425) "Action level" means the level of concentration of a hazardous substance, hazardous waste or a regulated substance in soil, groundwater or surface water that is established pursuant to NAC 445A.2272, 445A 22735 and 445A.2275 and for which corrective action may be required by the Director.

(Added to NAC by Environmental Comm'n, eff., 10-3-96)

NAC 445A.2261 "Administrator" defined. (NRS 445A 425) "Administrator" means the Administrator of the Division

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22615 "Aquifer" defined. (NRS 445A 425) "Aquifer" has the meaning ascribed to it in NAC 445A 812

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.2262 "Corrective action" defined.. (NRS 445A.425) "Corrective action" means a permanent remedy that an owner or operator is required to take after a release of a hazardous substance, hazardous waste or a regulated substance to prevent the substance or waste from posing a threat or potential threat to public health or the environment.

(Added to NAC by Environment Comm'n, eff 10-3-96)

NAC 445A.22625 "Director" defined. (NRS 445A 425) "Director" means the Director of the State Department of Conservation and Natural Resources

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.2263 "Division" defined. (NRS 445A 425) "Division" means the Division of Environmental Protection of the State Department of Conservation and Natural Resources

(Added to NAC by Environmental Comm'n, eff. 10-3-96)

NAC 445A.22635 "Groundwater" defined. (NRS 445A 425) "Groundwater" has the meaning ascribed to it in NAC 444.579

(Added to NAC by Environmental Comm'n, eff. 10-3-96)

NAC 445A.2264 "Hazardous substance" defined.. (NRS 445A.425) "Hazardous substance" has the meaning ascribed to it in NRS 459.429.

(Added to NAC by Environmental Comm'n, elf 10-3-96)

NAC 445A.22645 "Hazardous waste" defined. (NRS 445A 425) "Hazardous waste" has the meaning ascribed to it in NAC 444.843.

(Added to NAC by Environmental Comm'n, eff. 10-3-96)

NAC 445A.2265 "Operator" defined. (NRS 445A.425) "Operator" means a person in control of or having responsibility for the daily operation of a site, business or other operation where a hazardous substance, hazardous waste or a regulated substance is disposed of, used or stored.

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22655 "Owner" defined. (NRS 445A 425) "Owner" means a person who owns property where a hazardous substance, hazardous waste or a regulated substance is disposed of, used or stored.

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.2266 "Person" defined. (NRS 445A 425) "Person" has the meaning ascribed to it in NRS 445A 390.

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22665 "Regulated substance" defined. (NRS 445A 425) "Regulated substance" has the meaning ascribed to it in NRS 459 448
(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.2267 "Release" defined, (NRS 445A 425) "Release" has the meaning ascribed to it in NAC 445A.345.

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22675 "Remediation standard" defined. (NRS 445A 425) "Remediation standard" means the level of concentration of a hazardous substance, hazardous material or a regulated substance in soil, groundwater or surface water which corrective action is designed to achieve

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.2268 "Surface water" defined. (NRS 439.200, 445A 425) "Surface water" means all water open to the atmosphere and subject to surface runoff

(Added to NAC by Environmental Comm'n, eff 10-3-96; A by Bd of Health by R088-00, 8-3-2001)

NAC 445A.22685 Applicability. (NRS 445A 425) The provisions of NAC 445A.226 to 445A 22755, inclusive, apply to any site, business or other operation where corrective action is required, unless the corrective action is required at:

1 A facility for the treatment, storage or disposal of hazardous waste that is issued a permit pursuant to NRS 459.400 to 459 600, inclusive, and the corrective action is required for any violation of NAC 444.8632.

2. A disposal site, as defined in NRS 444 460, and the corrective action is required pursuant to NAC 444 7481 to 444.7499, inclusive

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.2269 Assessment of conditions at site of facility after notification of release of pollutant. (NRS 445A 425)

1 Except as otherwise provided in this section, if the owner or operator of a facility, or his designated agent, is required to give notice of a release pursuant to NAC 445A.345 to 445A.348, inclusive, the Division shall require the owner or operator to conduct an assessment of the conditions at the site of the facility, including an assessment of the condition of the soil or water, or both, to determine the extent and magnitude of the contamination

2 The Division shall not require an owner or operator to conduct an assessment of the soil required by subsection 1 if the level of contamination of the soil does not exceed the action level established for that soil pursuant to NAC 445A 2272 because of the actions taken by the owner or operator of the facility pursuant to NAC 445A.22695

3 An assessment conducted pursuant to subsection 1 must:

(a) Identify the relevant pathways specifically related to the site that affect public health and the environment; and

(b) Be approved by the Division..

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22695 Immediate action required under certain circumstances. (NRS 445A.425) An owner or operator shall immediately take any action necessary to mitigate and abate imminent and substantial hazards to public health or safety created by the release of a hazardous substance, hazardous waste or a regulated substance..

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.227 Contamination of soil: Order by Director for corrective action; factors to be considered in determining whether corrective action required. (NRS 445A.425)

1 Except as otherwise provided in NAC 445A.22715, the Director may require an owner or operator to take corrective action if the release of a hazardous substance, hazardous waste or a regulated substance contaminates soil and the level of contamination exceeds the action level established for the soil pursuant to NAC 445A.2272.

2 In determining whether corrective action is required, the Director shall consider:

- (a) The depth of any groundwater;
 - (b) The distance to irrigation wells or wells for drinking water;
 - (c) The type of soil that is contaminated;
 - (d) The annual precipitation;
 - (e) The type of waste or substance that was released;
 - (f) The extent of the contamination;
 - (g) The present and potential use for the land;
 - (h) The preferred routes of migration;
 - (i) The location of structures or impediments;
 - (j) The potential for a hazard related to fire, vapor or an explosion; and
 - (k) Any other information specifically related to the site which the director determines is appropriate
- (Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22705 Contamination of soil: Evaluation of site by owner or operator; review of evaluation by Division. (NRS 445A.425)

1 Except as otherwise provided in NAC 445A.22715, if an owner or operator is required to take corrective action pursuant to NAC 445A.227, the owner or operator may conduct an evaluation of the site, based on the risk it poses to public health and the environment, to determine the necessary remediation standards or to establish that corrective action is not necessary. Such an evaluation must be conducted using Method E1739-95, adopted by the American Society for Testing and Materials, as it exists on October 3, 1996, or an equivalent method approved by the Division.

2. The Division shall determine whether an evaluation complies with the requirements of Method E1739-95, or an equivalent method of testing approved by the Division. The Division may reject, require revisions be made to, or withdraw its concurrence with the evaluation at any time after the completion of the evaluation for the following reasons:

- (a) The evaluation does not comply with the applicable requirements for conducting the evaluation;
- (b) Conditions at the site have changed; or
- (c) New information or previously unidentified information which would alter the results of the evaluation becomes available and demonstrates that the release may have a detrimental impact on public health or the environment.

3. If the Division rejects, requires revisions be made to or withdraws its concurrence with an evaluation, it shall provide written notice of its determination and the reasons for its determination to the owner or operator. The owner or operator shall:

- (a) Submit a revised evaluation to the Division; or
- (b) Carry out the corrective action required by the Director.

4. Unless an evaluation is rejected by the Division or returned to the owner or operator for revision, the Director shall consider the results of the evaluation, the level of concentration of the hazardous substance, hazardous waste or regulated substance in the soil, and the points of compliance to be elements of the plan for corrective action.

5. Method E1739-95, adopted by the American Society for Testing and Materials; as it exists on October 3, 1996, is hereby adopted by reference. A copy of the method may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, at a cost of \$31.

(Added to NAC by Environmental Comm'n, eff 10-3-96; A 10-29-97)

NAC 445A.2271 Contamination of soil: Plan and schedule for completing corrective action. (NRS 445A 425) An owner or operator who is required to take corrective action pursuant to NAC 445A 227 shall submit to the Division a plan and schedule for completing the corrective action. Except as otherwise provided in NAC 445A.22715, the owner or operator shall not take any corrective action until the plan and schedule are approved by the Division.

(Added to NAC by Environmental Comm'n, eff, 10-3-96)

NAC 445A.22715 Contamination of soil: Waiver of requirements. (NRS 445A.425) The Director may waive the provisions of NAC 445A.227, 445A 22705 and 445A 2271 and require an owner or operator to take corrective action immediately after the release of a hazardous substance, hazardous waste or a regulated substance that contaminates soil if the release:

1. Has an actual or imminent impact on groundwater; or
 2. Is hazardous to public health and safety.
- (Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A 2272 Contamination of soil: Establishment of action levels (NRS 445A 425)

1 For the purposes of NAC 445A 227 to 445A.22715, inclusive, the action level for soil must be established at the following levels:

- (a) The background concentration or volume of a hazardous substance, hazardous waste or a regulated substance set forth in the permit issued to the owner or operator by the Division.
- (b) The presence of petroleum substance in soil in excess of 100 milligrams per kilogram. The level of concentration must be measured using Analytical Method 8015, adopted by the Environmental Protection Agency and modified for petroleum hydrocarbons, as it exists on October 3, 1996, or an equivalent method approved by the Division
- (c) If the potential for human exposure or damage to the environment from contaminated surface water or groundwater is the primary pathway of concern, the presence of a hazardous substance, hazardous waste or a regulated substance in soil at the level of concentration for that substance or waste listed in the Toxicity Characteristics Leaching Rule, 40 C F R. Part 261 24, as it existed on October 3, 1996 The level of concentration must be measured using Analytical Method 1311, adopted by the Environmental Protection Agency, as it existed on October 3, 1996, or an equivalent method approved by the Division
- (d) If inhalation, ingestion or dermal exposure is the primary pathway of concern or an applicable level of concentration is not listed in the Toxicity Characteristics Leaching Rule, the presence of a hazardous substance, hazardous waste or a regulated substance in the soil at an appropriate level of concentration that is based on the protection of public health and safety and the environment. The appropriate level of concentration must be determined by the Division using the Integrated Risk Information System, adopted by the Environmental Protection Agency, as it existed on October 3, 1996, or an equivalent method chosen by the Division

2 Except as otherwise provided by this subsection, if more than one action level for soil may be established using the criteria set forth in subsection 1, the most restrictive action level must be used. In no case may the action level be more restrictive than the background concentration of the hazardous substance, hazardous waste or regulated substance

3 The State Environmental Commission hereby adopts by reference:

(a) Analytical Method 8015, adopted by the Environmental Protection Agency, as it existed on October 3, 1996. A copy of the method may be obtained from the Environmental Protection Agency, at a cost of \$5

(b) The Toxicity Characteristics Leaching Rule, 40 C F.R Part 261 24, as it existed on October 3, 1996 A copy of the rule may be obtained from the United States Government Printing Office, Washington, D.C. 20402, at a cost of \$28

(c) Analytical Method 1311, adopted by the Environmental Protection Agency, as it existed on October 3, 1996 A copy of the method may be obtained from the Environmental Protection Agency, at a cost of \$5.

(d) The Integrated Risk Information System, adopted by the Environmental Protection Agency, as it existed on October 3, 1996. A copy of the system is available on-line through the Internet and may be obtained from an Integrated Risk Information System Representative at (301) 496-6531, free of charge

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22725 **Contamination of groundwater:** Order by Director. for corrective action; request for exemption; exception, (NRS 445A 425)

1. Except as otherwise provided in this section, the Director may require an owner or operator to take corrective action if the release of a hazardous substance, hazardous waste or a regulated substance contaminates groundwater and the level of contamination exceeds the action level established for the groundwater pursuant to NAC 445A.22735

2. An owner or operator may submit a written request to the Director for an exemption from the provisions of subsection 1. The request must be accompanied by such supporting information as the Director may require. The Director may grant the request if:

(a) The groundwater contaminated by the release is not a source of drinking water and is not likely to be a source of drinking water because it is economically or technologically impractical to:

- (1) Recover the water for drinking because of the depth or location of the water; or
- (2) Render the water fit for human consumption; or

(b) The total concentration of dissolved solids in the groundwater is more than 10,000 milligrams per liter and the groundwater is not reasonably expected to be a source of drinking water.

3. The Director shall not require an owner or operator to take corrective action pursuant to subsection 1 to achieve the remediation standard required by the Division if the owner or operator files with the Division a study which is acceptable to the Division and which demonstrates that, based on a review of available technology and the prohibitive cost of the corrective action, it is not feasible to achieve the required remediation standard.

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.2273 Contamination of groundwater: Plan and schedule for completing corrective action. (NRS 445A.425) An owner or operator who is required to take corrective action pursuant to NAC 445A.22725 shall submit to the Division a plan and schedule for completing the corrective action. The owner or operator shall not take any corrective action until the plan and schedule are approved by the Division.

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22735 Contamination of groundwater: Establishment of action levels. (NRS 445A 425)

1. For the purposes of NAC 445A.22725, 445A.2273 and 445A.2274 the action level for groundwater must be established at the following levels:

(a) The presence of 1/2 inch or more of a petroleum substance that is free-floating on the surface of

the water of an aquifer, using a measurement accuracy of .01 feet.

(b) The presence of a hazardous substance, hazardous waste or a regulated substance in groundwater at a level of concentration equal to the maximum contaminant level for that substance or waste established pursuant to the Safe Drinking Water Act, 42 U S C §§ 300f et seq, and 40 C F R. Part 141, as those sections existed on October 3, 1996.

(c) A level of concentration equal to the background concentration of a hazardous substance, hazardous waste or a regulated substance, if that level of concentration is greater than the maximum contaminant level established pursuant to paragraph (b).

(d) If a maximum contaminant level has not been established for a hazardous substance, hazardous waste or a regulated substance, a level of concentration equal to:

(1) The background concentration of the waste or substance; or

(2) An appropriate level of concentration that is based on the protection of public health and safety and the environment. The appropriate level of concentration must be determined by the Division using the Integrated Risk Information System, adopted by reference in NAC 445A.2272, or an equivalent method approved by the Division.

2. In establishing an action level pursuant to subsection 1, the Division may consider:

(a) The presence of more than one hazardous substance, hazardous waste or regulated substance in the groundwater;

(b) Any potential threat the contamination may pose to sensitive areas of the environment; and
 (c) Any other threat or potential threat to groundwater that is specifically related to the site. If more than one action level for groundwater may be established using the criteria set forth in subsection 1, the most restrictive action level must be used.

4. The Safe Drinking Water Act, 42 U.S.C. §§ 300f et seq., and 40 C.F.R. Part 141, as those sections existed on October 3, 1996, are hereby adopted by reference. A copy of those sections may be obtained from the United States Government Printing Office, Washington, D.C. 20402, at a cost of \$30.

(Added to NAC by Environmental Comm'n, eff. 10-3-96)

NAC 445A.2274 Contamination of groundwater: Remediation standard. (NRS 445A.425)
 Unless remediation of a release may be terminated pursuant to NAC 445A.22745, the remediation standard for groundwater shall be deemed to be the action level of the groundwater.

(Added to NAC by Environmental Comm'n, eff. 10-3-96)

NAC 445A.22745 Contamination of groundwater: Monitoring; conditions for terminating remediation of release. (NRS 445A.425)

1. After any corrective action required by NAC 445A.22725 is begun, the owner or operator shall ensure that the contaminated groundwater is monitored for not less than 1 year to determine the level of contamination in the water. The Division shall determine the frequency of the monitoring, but in no case may the Division require monitoring more frequently than once each month.

2. After any corrective action required by NAC 445A.22725 is completed, the owner or operator may terminate remediation of the release if:

(a) An assessment of the contaminated groundwater is conducted and indicates that the level of contamination is consistently below the action level for that water established pursuant to NAC 445A.22735; or

(b) After the groundwater is treated for not less than 1 year, the concentration of dissolved constituents in the water, measured monthly, fits a curve that is substantially linear and approaches zero slope at the final portion of the curve. The curve must be established using the following equation:

$$C = C_f + C_o e^{-kt}$$

Where: "C" means the concentration of the contaminant at "t" in micrograms per liter.

"C_f" means the final concentration of the contaminant in micrograms per liter which the curve approaches asymptotically.

"C_o" means the difference between the final concentration of the contaminant and the concentration of the contaminant at time zero in micrograms per liter.

"e" means the base of the natural log or 2.718.

"t" means the time measured in days.

"k" means the decay constant.

(Added to NAC by Environmental Comm'n, eff. 10-3-96)

NAC 445A.2275 Contamination of surface water. (NRS 445A 425)

1. The Director may require an owner or operator to take corrective action if the release of a hazardous substance, hazardous waste or a regulated substance contaminates surface water and the level of contamination exceeds the action level established for the water pursuant to subsection 2.

2. For the purposes of subsection 1, the action levels and remediation standards for surface water must conform to the standards for water quality set forth in NAC 445A.120, 445A 121, 445A 122 and 445A.144

3 An owner or operator who is required to take corrective action pursuant to this section shall submit to the Division a plan and schedule for completing the corrective action The owner or operator shall not take any corrective action until the plan and schedule are approved by the Division...

(Added to NAC by Environmental Comm'n, eff 10-3-96)

NAC 445A.22755 Public hearings regarding corrective action affecting more than one owner or operator. (NRS 445A 425) The Administrator may hold such hearings as he deems necessary to obtain public testimony regarding any corrective action required to be taken pursuant to NAC 445A 226 to 445A 2275, inclusive, which affects more than one owner or operator or members of the general public

(Added to NAC by Environmental Comm'n, eff 10-3-96)